5: Reyes and Teran--45-47 (No date) 1939 Jivaro-1
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"The surface elevation of this immense region [JKM: Ecuadorian province of Oriente] varies from about 4,000 meters--average height of the eastern cordillera of the Andes--down to about 120 or 100 meters in the region of the Amazon. The general slope indicates the direction followed by the tributaries of the great river, which is commonly from northwest to southeast.

According to almost all the geographers who have analyzed it [GCB: the Cordillera Real], the numerous outliers or branches which spread out from it, [46] act as dividing lines for the rivers which form our [GCB: Ecuadorian] principal river systems of the Oriente. Thus, the cordillera of Pisambilla divides the basins of the Coca and the Aguarico, tributaries of the Napo; just as the cordilleras of Galeras and Guacamayos divide the basins of the Coca and Napo. [GCB: In the same way] the Llanganati extend between the Napo and the Pastaza; the cordillera of Sangay between the Palora and the Upano; that of Logrono between the Upano and the Paute or Namangosa; that of Yahuarsongo between the Paute and the Zamora, and that of the Condor between the Santiago and the Chinchipe.

Between these outliers, which range in elevation from 2,000 to 3000 meters, are enclosed valleys and plains which constitute the most advantageous part of the Amazon basin. In this zone are located almost all the settlements and ranches of our [GCB: Ecuadorian] Oriente. Below these outliers, [47] begins the uniform plain which loses

itself in the Amazon, where neither the climate nor the composition of the soil permits men to settle."

5: Reyes and Teran--59-61 (No date) 1939 Jivaro-1
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"Basin of the Pastaza

This river forms another hydrographic basin which, with that of the Tigre, composes our [GCB: Ecuadorian] Central Oriente. The Pastaza, which collects the waters of two interandean basins--the Patate and the Chambo--opens to the east of Ambato the deepest breach in the Cordillera Oriental. This breach undoubtedly constitutes the best route to gain access to the heart of the forest and the best field of study for the geologist who desires to become acquainted with our remarkable volcanic phenomena. To the north of the Tungurahua river, the Pastaza runs between walls of modern lavas, forming narrow channels and cataracts, like the bed of the Agoyan, so that this Cyclopean sweep well deserves the name of an heroic current up to the point [60] where it reaches the plain and directs itself toward the southeast.

On its left side, the Pastaza receives the waters from the Topo river (which descends from the Llanganati), and the waters of the Puyo, Bobonaza and Pinda rivers, which have their sources in the eastern sierras of Mera. And on the right side, in return, the Pastaza receives the Lusin and Palora rivers, which descend directly from the Andes, and the Huasaga, which arises in the same forest. While the current of the Pastaza is rather fast, the river is navigable for about 430 kilometers, up to [GCB: the town of] Andaos; but steamboats can ascend only as far as Huasaga (190 kilometers). The mouth of the river is about 402 kilometers to the west of Iquitos.

The Tigre, which is also included in the Central Oriente, has its sources at some distance from the Andes, so that it may be regarded as solely a river of the plains. From its left side it receives the Pucacuro river, and from its right the Corrientes. The Tigre is at some distance from our [GCB: Ecuadorian] centers of settlement, for which reason we do not know [61] much about its geographical characteristics. Few rivers like the Tigre have a better bed for navigation; steamboats can ascend it without danger as far as Piedra, 593 kilometers from its mouth."

"The Basins of the Morona and Santiago

These two complex hydrographic basins form what we might call the Eastern Oriente, or more properly, the Oriente Azuayo, because further to the south we still have to deal with the basin of the Chinchipe, which despite its easterly position, cannot be included in this group because of special characteristics which necessitate a separate study. The Morona, navigable for about 300 kilometers, has its source at the Macuma on the heights called Cutucú which divide the waters of the Upper Pastaza and the Santiago, a few hours to the northeast of Macas.[62]

Like the Tigre, the Morona is detached from the Andes, and its character is clearly that of a plains river. From the same cordilleras of Cutucú arises the Morona's main tributary, the Mangosisa, which, united with the Miazal, forms the Unda-Mangosisa; from the confluence of this river with the Macuma, (on which is located Puerto Proano, 555 kilometers from the Amazon), is formed the real Morona, which offers easy navigation, since its course is not marked by sharp drops.

The Santiago embraces a complex hydrographic network whose remote sources are quite distant from the true Santiago, the name by which it is known only well within the forest. It is formed by the [GCB: confluence] of the Paute and Zamora rivers, which collect the waters from the interandean basins of Cuenca and Loja, which in return receive immense tributaries. The Paute, once free of the cordillera, where it is preferably known as the Namangosa, unites with the Upano, a much larger stream which

rises in the Laguna Negra, [63] on the Macas-Riobamba pass. Located at the junction of these two rivers is the flourishing settlement of Mendez.

The valley of the Upano is astonishingly fertile and holds the most important eastern settlements. The Zamora, in forming its great northern convexity as it seeks the Paute (or Namangosa) follows a general direction contrary to that of the great eastern rivers. On its left margin it receives the Yacuambi, the Bomboiza and the Gualaquiza, which carry down a good quantity of gold from the high, cold regions of Matanga or of Shingata. On these streams are the rich placer mining locations which have attracted so many miners to the Oriente Azuayo.

The navigation and importance of the Santiago as a route of descending to the Marañón river are the subject of much controversy, for between the mouth and the navigable channel of this great river are two major obstacles--the pongo [GCB: narrow and dangerous rapids] of Chico and that of Manseriche; moreover, both tributaries--the Paute and the Zamora--run exceedingly swift gorge-like channels for most [64] of their length."

5; Reyes and Teran--66-68 (No date) 1939 Jivaro-1
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"Navigation [GCB: of the eastern Amazon] really begins at the end of the pongo of Manseriche, east of the mouth of the Santiago river, where once was located the old Spanish settlement of Borja, capital of the famous province of Mainas....Becoming as narrow as 30 meters in these gorges, the river is proportionately widened on the plain as each voluminous tributary pours into it from one or the other of its banks. [67] La Condamine estimated that its width at the village of Omaguas, between the Tigre and the Nanay rivers, was 765 meters, and he did not find its depth to be more than 100 fathoms. At the mouth of the Napo its width was calculated by the same authority as 1,840 meters, while the width of the mouth of this tributary was fixed at 1,250 meters. But these dimensions vary considerably with the crecidas [freshets]; it is then that an immense zone along its muddy sides, reaching about 5 kilometers in width, is covered by its waters. As the river subsides, the water still remains in the concavities of the terrain, and sometimes forms brazos [arms] which contain islands, or sometimes forms numerous lagoons, which in periods of dryness remain isolated from the running waters.

The possibilities of navigation along the [GCB: eastern] Amazon increase or diminish according to whether one is concerned with the dry period or the period of the freshets. In the former, steamers can ascend only as far as the mouths of the Morona, and in the latter, [68] somewhat farther east, as far as old Borja. The two settlements

of major importance along the northern banks of the great river are Iquitos, at the mouth of the Nanay, and Nauta, between the mouth of the Nanay and that of the Tigre. By law and by geographic necessity, Ecuador can never renounce access to this section of the Amazon."

"The Amazon basin's situation in the center of the torrid zone, together with its low altitude and the orientation of the continental ranges, permitting the direct influx of the Atlantic trade winds, gives it a clearly equatorial climate of the continental type. According to the classification of Emmanuel de Martonne, equatorial climates should have, in general, a mean temperature of 25° [GCB: Centigrade], a relative humidity of 80 excepting in the dry period, uninterrupted heat, frequent storms, and an annual precipitation of more than 1,500 millimeters, but in continental [GCB: regions], naturally [70] some of these characteristics vary a little. Thus, the humidity is less, while the temperature, on the other hand, is higher and the rain does not fall as regularly.

However, the Ecuadorian Oriente cannot be regarded as having a complete [GCB: climatic] uniformity, since the slopes of the Andes and the plains proper differ, on the one hand, in relief, and on the other, in the greater nearness of the former to the cordillera, where the trade winds release a great part of the moisture which they have collected [GCB: in their course] from East-Southeast to West-Northwest. These factors have resulted in the establishing of two zones with well marked climatic differences: that of the Andean slopes and that of the plain near the Amazon.

(a) The Andean Slopes: In this sector, the altitude, which often exceeds 400 meters, causes a decrease in temperature, as we have seen, thanks to the data, even though meager, furnished by the bulletin of the Astronomical Observatory [71] of Quito. But

on the other hand, because of the fact that this region adjoins the wall of the Andes, against which are condensed immense masses of water vapor gathered up by the trade winds from the Atlantic, the humidity is considerably increased, in comparison with the amount released over the plains proper. Not very far from the Andean cordillera is the belt of maximum rainfall. In this belt are points where the rain gauge might measure more than 5,000 millimeters annually, according to J. Colony and Joseph Sinclair. For this reason, the area might well be classed among those of the super-humid type.

Here [GCB: climatic] conditions are defined, then, only by the scale of the rain gauge. There is a summer and a winter--less rain in the first case and a maximum in the second. These conditions, which are directly inverse to those on the Pacific coast, coincide with the astronomic conditions of the Southern Hemisphere. The [72] winter season lasts from March to October, becoming intense in June and July; the rest of the year is summer. The rains are true deluges which leave great areas flooded, and swell even the smallest streams to fantastic heights. The following numerical data confirm this assertion:

'In all sections on the slopes of the Cordillera Oriental, precipitation is very considerable. We do not know at what average altitude on the slope of the Cordillera the precipitation is greatest. In Mera during the first five years [GCB: of the record] the

precipitation had a total mean of 4,555 millimeters. During the year 1932-33 an average of 5,530 millimeters of rain fell; in 1932 the precipitation was 6,010 millimeters, and in 1933 5,051 millimeters. Assuming that these observations are correct, the annual quantity of rainfall varies in no small proportion. The monthly averages are also quite variable; a dry period hardly can be distinguished; the data from travel works and similar [GCB: publications] are not confirmed by measurements although [73] as a general rule the greatest precipitation is expected between the months of March and August. In 1932 the maximum precipitation [GCB: for any one month] 700 millimeters --fell in May. Almost the same quantity--690 millimeters--fell in January [GCB: of the same year]. The minimum--319 millimeters--fell in September. In 1933 the maximum--609 millimeters--fell in July; the minimum --242 millimeters --in October. "(1)

In the same settlement of Mera, in 1927, 4,869 millimeters of rain fell within 292 days. In Tena [GCB: another settlement] the totals for eight years were 4,869 in 1928; 4,885 millimeters in 1929; 4,475 in 1930; 3,466 in 1931; 3,233 in 1932; 3,142 in 1933;

"1. 'Contribuciones al conocimiento de la Vegetacion y de la Flora del Ecuador' by Ludwig Diels. Translated [GCB: into Spanish] by Dr. Reinaldo Espinosa. Anales de la Universidad Central, No. 304 Quito-Ecuador."

3, 327 in 1934; and 3, 828 in 1935. These totals average 3, 902 millimeters for the eight years. In [GCB: the settlement of] el Puyo, an average of 3, 945 millimeters fell during the period from 1915 to 1928, according to data taken by [74] Nicolas Martinez. In La Victoria, on the slopes of el Abitagua, near the Topo river, at an elevation of 1, 240 meters, the [GCB: average] rainfall was 2, 863 millimeters. From other points in the Oriente we do not have complete annual figures; but to give a rough idea of the amount of difference between some months and others, we have compiled the charts, however incomplete, which are presented below.

The winds which control and cause these rains are the trade winds. The wall of the Cordillera Oriental impedes their passage, except in small sectors of the mountain basins whose valleys face toward the Oriente. For this reason the trade winds are not found either in the mountains or along the coast. Sometimes these winds are changed into hurricanes, leaving swaths through the midst of the forest which mark the direction they have followed.

With this respect to temperatures on these slopes or outliers, they [75] generally do not exceed 25 degrees [GCB: Centigrade], nor do the variations, whether daily or monthly, undergo too sudden changes. Summing up his observations at the Hacienda Río Negro at an elevation of 1, 250 meters above sea level on a terrace of the Pastaza river, Ludwig Diels writes in the above mentioned work:

5: Reyes and Teran--69-92 (No date) 1939 Jivaro-5
116, 132

'During my stay, I noticed that [GCB: the temperatures] each day followed a similar course. Toward 7 [GCB: a. m.] the temperature reached 16-17 degrees [Centigrade]; after mid-day, between 13 and 15 o'clock [GCB: 1 and 3 p. m.] it reaches 23 to 27 degrees; at night, at 19 o'clock [GCB: 7 p. m.] 20-23 degrees. During the morning there was generally heavy evaporation [GCB: mist?] which was dissipated about 10 a. m.; it then cleared up, and the sun would appear toward noon; in the afternoon it would regularly become cloudy; toward 5 to 6 p. m. it ordinarily began raining, sometimes in the form of a storm which increased in intensity up to 7 and 8 p. m., diminishing slowly and generally lasting until sunrise.'

According to the information of travelers, this course of [GCB: the day's time] is characteristic of the eastern slopes. More precise measurements are available only from Tena, situated 8 kilometers to the east of Topo, at an elevation of 1,100 meters. They pertain to several years (1922-26 and 1932-33).

The temperatures found on the Upper Pastaza are about equal [GCB: to those of Tena] in their distribution. The difference between the highest and the lowest monthly temperature is, in Baños, 1.8 to 2.6 or degrees; in Mera, 1.5 to 2.1 degrees; perhaps in el Topo it may be even somewhat less. The general characteristics of the course of the temperatures are illustrated by the values for Mera, at an elevation of 1,100 meters.

in 1933.

In Tena, at an elevation of 512 meters, the hot month of the year has a mean average temperature of from 24.1 to 25.8 degrees [GCB: Centigrade.] The coolest month has temperatures which average 2.1 to 3.7 degrees lower. The coolest time of the year falls between June and July. [87] [Intervening pages are charts.]

Complete data are lacking even for one year, and with greater reason, for cycles of greater magnitude, so that it is risky to formulate general conclusions. However, by means of the above figures it may be seen that the months of high temperature coincide with those of the eastern summer, culminating in December. In the same way, the months of least temperature coincide with those of the winter in the same hemisphere, reaching major emphasis in June and July. The rains, on the other hand, become increasingly heavy following the March equinox, and attain their maximum in May and June, although their cycle is less regular than the thermal one.

(b) Amazon Plain If the climatic data of the zone we have called that of the Andean slopes are thus so meager, we may well understand the situation in this other region, whose domination by man has not yet even begun. Suffice it to say that [88] Rocafuerte, at the confluence of the Aguarico river with the Napo, still lacks a small meteorological station. Located at an elevation of 180 meters, Rocafuerte is today the most remote military base of Ecuador in its campaign to dominate the inhospitable forest.

5: Reyes and Teran--69-92 (No date) 1939 Jivaro-7
116, 132

The data referring to Iquitos, on the left bank of the Amazon, at an elevation of 80 meters above sea level, were collected by Wilhelm Sievers and may serve as a means of estimating the climatic conditions of the Amazon plain proper. At 3.44 degrees, South latitude, Iquitos has an average annual temperature of 26 degrees [GCB: Centigrade], with a variation of only 1.7 degrees; in fact, November, the hottest month, does not go above an average of 26.9 degrees, and June, the coldest, does not go below 25.2 degrees. The averages of the extremes also fall within a very narrow range--32.4 and 18.4 degrees--but the winds from the South bring with them in June and July, nevertheless, a considerable cold spell which [89] constitutes what is called el inviernito [GCB: little winter] of Saint John.

According to Hann, the total annual precipitation [GCB: at Iquitos] is 2,840 meters; according to Votz, it totals 2,623, but what chiefly characterizes the rainfall is that no month passes without abundant precipitation. Even the driest months, August and July, receive more than 100 millimeters--117 and 167 respectively. As for the most humid months, March and December, the totals are 291 and 300, [GCB: respectively.] Thus there is no well defined season of rainfall, but the year has four periods of maximum precipitation: one in March, a second in December, a third, of 254 millimeters, in May, and a fourth, of 221, in September. It may be said, nevertheless, that the type of the annual rainfall is that of the eastern hemisphere, since in the months from

December to March fall 1,112 millimeters of rain, or about 42 per cent of the year's total. The winds are generally cool and from the southwest from June to [90] November, and warm and from the northwest during the rest of the year.(1)

If by means of the above data this [GCB: Amazon plain] region is compared with the former [Andean slopes] zone, the following differences are immediately apparent: in temperature, the figures for the second [GCB: or plain] region are higher than those of the first, commonly exceeding 26 degrees [Centigrade], while in rainfall just the opposite occurs. Here [GCB: in the plain] the precipitation rarely exceeds 3,000 millimeters.

To sum up several aspects of the climate of the great Amazon Basin, we cannot resist quoting the following paragraph which through its excellent metaphor brings home a profound geographic truth. 'The mist in the Llanganati is omnipresent. This is easily explained. A muddy tropical caldero [GCB: caldron or basin] with an area of about three million (?) square kilometers, like that of the Amazon, [91] which lies at the foot of the Llanganati, we can easily understand, must be incessantly evaporating millions of tons of water, resulting in the formation over itself of an enormous continent of clouds. But this 'continent' moves, advances and attacks without repose, like

"1. 'Geografía de Bolivia y Perú' por Wilhelm Sievers. Colección Labor, Número 288."

a cosmic nebula which comes to battle and destroy itself against the Andes to give birth to the immense Amazon. But above all, the cold and elevated granite masses of the Llanganati, advancing as they do toward the east, are the ultimate condensing agents which force all these dynamic masses of clouds, progressing enslaved from East-Southeast to West-Northwest in the arms of the tradewinds, to precipitate themselves in the form of torrents of water, as they erode the high Andes and level their peaks.(1)"

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"1. 'Viaje a las misteriosas montañas de Llanganati' por L. Andrade Marin, Quito, 1936."

"In regard to the flora, it would be difficult to find in any part of the earth a more dense and abundant vegetation. However, not all of the area which the Ecuadorians call the Oriente has identical vegetation. If one descends from the páramos [high cold regions] of the eastern cordillera toward the Amazon region, between the elevations of 3,200 and 1,600 meters, approximately, one finds an intermediate or mixed zone of wooded slopes [Vertientes boscosas] very similar to [94] the western coastal plain. This zone has the identical subtropical flora and fauna, although naturally, the wooded slopes have a thicker growth, a more rugged character, and an extent vastly greater than those of the Pacific zone.

The most distinctive feature of the flora of the eastern Andean slopes probably is the ishpingo or cinnamon tree (Nectandra cinnamomoides), in search of which the first white man, Gonzalo Pizarro, went into the interior from Quito,(1541). Thus he opened the route which was to lead one of his companions to discover the Amazon. From this tree, part of our [GCB: Ecuadorian] Oriente takes the name of Canelos or country of the Canela.

According to Gonzales Suarez, "these trees are as tall as olive trees; their blossoms open like buds [capullos] in which is the substance which in fragrance and taste is very similar to cinnamon. The best and most fragrant [95] fruit is generally that of the trees which are cultivated in orchards such as the Indians of Quijos had before the

Conquest. They used it as a kind of money in the transactions they used to have with the other towns of the province of Quito in the time of the Incas. Atahualpa, in Cajamarca, sent Pizarro several bunches of these fragrant flowers.

In this same zone, particularly toward the South, are found the best chinchonas [GCB: Peruvian bark trees] of the few which still remain in Ecuador, including among them the most valuable ones in the world. This famous tree, more commonly known by the name of cascarilla or quina, constituted a great source of wealth our country [GCB: Ecuador] prior to the time when the English and Dutch established their celebrated plantations in India and in some of the Sunda Islands, respectively, taking the first specimens from the [GCB: Ecuadorian] Lojanos woods. [96]

In the region of Mendez is found the alcanfor [GCB: camphor tree] whose resin frightens away the most terrible enemy of wooden constructions--the comején [wood-borer].

The Caucho [GCB: rubber tree] (ficus elastica) is found growing wild. Its exploitation attracted in particular an enormous number of adventurous Colombians and Peruvians. These people, besides devastating this valuable tree, were the cause of the most serious conflicts between the nations disputing the dominion of the forest. When the product of this tree was quoted at high prices [GCB: in the world rubber market] the customhouse at Iquitos took in as much revenue as that of Guayaquil.

The Tagua [GCB: ivory nut tree] (phitelepa macrocarpa) which is so successfully grown on the coast, is not made use of here [GCB: in the interior] in spite of its abundance. From Julapas to the Arapicos river, in the Macas region, there is a huge stand estimated to total almost one hundred million hectares. [97]

The zarzaparilla [GCB: sarsaparilla] (Smilase obliguata ruisiana) is a climbing vine which grows wild. Its exploitation [GCB: in the Ecuadorian Oriente] has started an active trade with Brazil, the United States and Europe in medicinal products.

The Copal [GCB: tree yielding a transparent resin] (Himenea courbail verrucona) is a tree whose resin is used for illumination.

The Cacao [GCB: chocolate tree] (Teobroma cacao) is found abundantly in the wild state. Its presence suggests that the cultivation of domestic varieties would be both easy and profitable.

The Vainilla [GCB: vanilla plant] is an aromatic plant which grows best in the basin of the Upano river. Its exploitation, like that of the caucho [GCB: rubber tree], has been so foolishly and irrationally conducted that the search for it is becoming daily more difficult.

The barbasco (Jacquinia armillaris tac) is a shrub whose poisonous root [98] is made use of to fish by poisoning the waters. The immoderate use of this practice is likely to have disastrous consequences for the breeding of fish in the rivers of the Oriente.

The natema, climbing vine of the passifloraceous family, is a powerful narcotic. An infusion from its stem frequently is used by the Jivaro to treat sickness or to obtain prophetic dreams.

Precious woods, valued for their texture as well as for their beautiful coloration and agreeable odor, are innumerable. But those most exploited are cedar, ebony, mahogany, oak, lignum-vitae [guayacan] etc. (1)

The plants briefly cited above are only those which have been the object of primitive exploitation. In few regions [GCB: of the world] can the botanist and the naturalist [99] find a more vast and extensive field for his studies, as the varieties of vegetation are infinite.

Below the altitude of 500 meters, is the domain of the humid tropical forest, although it would be an error to suppose that it occupied all the land under this height. For while the forest predominates, it nevertheless is frequently interrupted, and alternates with thickets of perennial and stiff foliaceous plants, and with clumps of trees and brambles.

This humid tropical forest is poor in low-growing ligneous plants. For here the

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"1. Data from 'Album-guia de la Region Oriental Ecuatoriana' por Alfonso Rumazo González."

light reaches the ground with difficulty; the earth is covered with dead leaves, mossy sod, and shady plants such as ferns, whose perpetual growth and decomposition through heat and humidity constitute the best fertilizers for arboreal species. Above this zone, which we may call the lower plane of the forest rise the palms of middle height, and above these, the tall giants of the forest, with [100] high crowns, whose branches have no leaves except at great heights.

Lianas and epiphytes [GCB: varieties of vines] are also an essential part of the tropical forest. Of these, there are two classes: the low, which is nourished by the dampness, and the high, which entwines itself around the treetops."

5: Reyes and Teran--100-102 (No date) 1939 Jivaro-1
116, 136

"The fauna is purely tropical. The richness of its species is surprising, not only in their great variety, but in the number of individuals within each class. All the zoological orders are richly represented, above all, the insects, birds and fishes. Only with respect to the great mammals is this area surpassed by the Asiatic or African forests.

Among the best known animals, the monkeys--not the great four-handed ones--animate the woods in numerous hordes. The tapir or danta, because of his corpulence may be considered the king of the forest. Among the feline animals the jaguar, tigrillo and puma are outstanding. The common bear and the ant-eater [oso hormiguero] are much [101] pursued for their meat. The guatuza, a well developed species of rabbit, armadillos, squirrels, sahinos or wild pigs and many other quadrupeds populate the forest.

The birds are perhaps the representatives of the Oriente's zoology which attract most attention, because of their showy plumage and sonorous calls. They are granivorous or fructivorous, and for this reason all migrate, from the Maranon river to the first slopes of the cordilleras, following the maturation of the fruits, from the warmest lands to the coolest. It might be said that each tree has its parasite bird, which prefers its particular fruits; and the Jivaro Indians, very skilled in hunting with the blowgun

[cervatana] know well what is the season of the parrots, when is that of the turkey hens, and above all, when is the season for an infinity of small birds, which fly in hundreds from tree to tree eating flowers or fruits.'[102]

Migration is therefore a characteristic phenomenon of the birds of the Amazon woods.

Among the reptiles--the animals which perhaps constitute the greatest danger of the forest--are found enormous snakes such as the boa and anaconda, whose size has been much exaggerated. Turtles, which lay their eggs on the islets or beaches of the minor channels along the rivers; frogs, salamanders, poisonous serpents, although to a lesser degree than along the coast, are frequently encountered in these woods. And finally, there are the insects, which inject a note of varying color into the infinite green of the forest. The most beautiful and rare species of butterflies appear from 10 o'clock in the morning to three o'clock in the afternoon, although they commonly fly among the crowns of the giant trees and are therefore quite difficult to chase. Because of this fact the collecting of these insects is an expensive proposition."

S: Reyes and Teran--103-104 (No date) 1939 Jivaro
116, 241

"Among the cultivated plants the following are outstanding: sugar cane, the plátano [GCB: plantain, or banana, tree and fruit], the yuca [GCB: yuca or casseava plant?] which are easily the basic item in the diet of the natives; the peima, whose bulb has some similarity to the potato; the camote [GCB: sweet potato], the café [GCB: coffee tree]; the achiote [GCB: arnotto tree]; the tobacco plant, the algodón [GCB: cotton plant]; the arroz [rice] plant; the maíz plant [GCB: maize or Indian corn]; the papaya, the piña [GCB: pineapple]; the guaba [guava]; the chontaruro; the guayaba [GCB: fruit of the guava tree]; the orange; and many other fruit trees which yield rapid and abundant crops. Water, light and warmth, the decisive factors [104] in the development of plants, are the patrimony of the Oriente lands. To these factors is due the vigor with which they increase and multiply. Unfortunately, the isolation of these vast regions prevent these cultivated plants from being useful for any more than local consumption."

Sr Reyes and Teran--104-105 (No date) 1939 Jivaro
116, 231

"The only animals raised by the natives are the chancho [OCB: agouti] and the dog, both of which are given little care. The chanchos are of an almost wild species. As a general rule, the women have charge of their care, abandoning them completely to the woods [105] during the day, and calling them with shouts at about sunset. On hearing the voices of the women, they return to get something good to eat, but many times when they find good feed in the woods, they do not return for several days, and thus become easy prey for jaguars and pumas."

5: Reyes and Teran--105 (No date) 1939 Jivaro
116, 262, 757

"The Jivaro Indians are very fond of the flesh of the pig, which they eat roasted and also boiled. They also extract the lard, but they use it only as a remedy for dysentery. (1)"

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"1. 'Album-guía de la Region Oriental Ecuatoriana,' por Alfonso Rumazo González."

Fs Reyes and Teran--107 (No date) 1939 Jivaro
114, 135, 487, 177

"The scarcity and rudimentary state of communication routes has obliged people living in the Ecuadorian Oriente to seek their economic well-being largely through mining rather than through agriculture, in spite of the fertility of these lands. And among the minerals, it is the exploitation of gold which today mainly concerns those [GCB: white men] who venture into these regions. Gold also is the concern of a large number of natives whose labor is exploited by the whites."

5: Reyes and Teran--108-109 (No date) 1939 Jivaro
116, 161, 177

"Unemployment in the centers of population has brought into the forest a large number of placer miners, many of whom, after a brief period of struggle with the wilderness, have returned with respectable fortunes. These men are the remarkable gold miners who impart an atmosphere of activity and progress to many settlements of the Oriente, even though they frequently bespatter them with blood. The following data may give some idea of the intensity with which this work is being carried on:[109]

| | |
|---|---|
| Number of men washing gold in the Napo and its tributaries..... | 3,500 |
| Number of men washing gold in the Pastaza and its tributaries..... | 1,000 |
| Number of men washing gold in the Upano and its tributaries..... | 300 |
| Number of men washing gold in the Paute and its tributaries..... | 2,500 |
| Number of men washing gold in the Zamora and its tributaries..... | 5,200 |
| Number of men washing gold in the San Francisco and other tributaries of the Chinchipe..... | 2,000 |
| Number of men washing gold in the placers of the Nabon, Chordeleg, Zaruma, Gualaquiza and the cordillera del Condor..... | 3,500 |
| Total..... | 18,000 " |

5: Reyes and Teran--113 (No date) 1939 Jivaro
116, 135

"Another great potential source of wealth possessed by the Oriente is petroleum."

5: Reyes and Teran--117-118 (No date) 1939 Jivaro
116, 161

"This new geographical aspect of the Ecuadorian Oriente, like those previously studied, lacks concrete and precise data, both with respect to the ethnology and the statistics of the subject. According to the most careful study made up to the present time--that is, to December 31, 1937, the population of the Oriente is calculated as 36, 265 inhabitants distributed over an area of 313, 836 square kilometers. This gives an average population density of 0.045 per square kilometer; and by provinces the data may be presented thus: [118]

| Province | Population | Area | Density |
|---|---|---|---|
| Napo-Pastaza | 211, 595 | 229, 101 [GCB: square] kilometers | 0.05 per hectar |
| Santiago Zamora | 3, 670 | 84, 735 " " " | 0.04 per hectar (1) |

Most, if not all, of the population is found on the outliers of the Andean cordillera, above the elevation of 400 meters by reason of climatic factors."

"1. 'La distribución geografica de la población del Ecuador'--Estudio del General Paz y Mino, --.... Floating population not included."

5: Reyes and Teran--118-119 (No date) 1939 Jivaro
116, 101, 361

"The native tribes are grouped more by language divisions than by ethnic differences, and the Pastaza river is the dividing line. Those who speak Quechua live to the north of this line, while those speaking Jivaro live to the south. Neither group lives in settlements, [191] as it is their custom to live in isolation in the depths of the forest, even though they do not keep entirely away from the settlements of the whites, with whom they maintain commercial relations through trading gold or some other native product for trinkets, in which they manifest particular interest."

Si Reyes and Teran--120 (No date) 1939 Jivaro
116, 105

"The Jivaros, are characterized by the boldness with which they defend their liberty and independence. They live in the forest areas drained by the Pastaza, Morona and Santiago rivers as far up as Guadalquiza, and no one has succeeded in conquering or subduing them. Their constant occupation is war, which little by little is decimating their numbers. Their customs are distinctive and constitute the most curious folklore, exploited by writers and travelers alike. Sorcery, superstitions, fiestas, dreams, all are woven into the warp of life in the Jivaro country."

Sz Reyes and Teran--120-121 (No date) 1939 Jivaro
116, 181

"In addition to the above mentioned groupings, those of the Záparos on the Tigre, the Aucas on the Curaray, and the Muratas on the lower Pastaza also are worth noting. In neither their numbers nor their personalities, however, do these groups stand out like the Quechuas and Jivaros. [121] Of all the aboriginal groups of the Oriente, the Jivaros are the most industrious and intelligent, although they resist civilization because of their repugnance to enter into social relations with the whites, whom they consider as objects of pity, subject to multiple needs, and above all, lacking in the sagacity and endurance required for the life of the forest."

S: Reyes and Teran--122 (No date) 1939 Jivaro
116, 563

"The whites in the Oriente are almost entirely from the [GCB: Ecuadorian] altiplano and have come into the forest still searching, like their remote ancestors, the chimerical El Dorado. From Archidona to Macas, according to Sinclair and Wasson, there are not more than 600 whites, and these are largely concentrated in the latter settlement. Of the original Spanish colonists, there is clearly not a single descendent left."

"Macas is the largest settlement in the forest. It is about as well or perhaps better established as was Sevilla del Oro, destroyed by the Jivaros in the Sixteenth century. Located 1091 meters above sea level on the banks of the Upano, it has about 1,000 inhabitants, and in the midst of such isolation, boasts such remarkable advancements as electric light service, a hospital, etc. It is more or less at the latitude of Alausí, and may be reached most easily from Cuenca, in the south.

Méndez, founded by Eudolfilo Alvarez in 1913, has been converted into a major gold market. Located on the banks of the Paute, at an elevation of 700 meters, in a gorge which does not permit much [124] agricultural development, it is, on the other hand, the headquarters for an immense floating population which searches avidly for the precious metal in the sands of the river. There are about 600 permanent inhabitants.

Mera, at the gateway to the forest, where the canyon of the Pastaza widens and loses itself on the great plain, is attracting a large stream of immigrants because of its climate and fertility. These newcomers will soon transform the place into an agricultural center of much importance. The town has in the neighborhood of 200 inhabitants. Very near to it is the settlement of Puyo, which has excellent possibilities for future development.

Tena and Archidona are the oldest and most firmly established towns of the Napo region. While the former has made notable progress thanks to its Josefino missions,

the latter, on the other hand, has declined greatly, in spite of having been, in former times, the key to the Oriente.

Rocafuerte, at the confluence of the Aguarico with the Napo, is the most [125] remote settlement of our effective domain in the Oriente. It is the center of the main military garrison of the Oriente; its scant 180 meters of elevation gives it an essentially tropical climate which is quite exhausting. Also on the left bank of the Napo, and separated from Rocafuerte only by a slight depression of the terrain, is the Peruvian garrison of Cabo Pantoja. The isolation of Rocafuerte from the other population centers of Ecuador makes it necessary for its inhabitants to be subjected to the economic despotism of the Peruvian markets.

Zamora, Gualaquiza, Indanza, Sucúa, Puerto Napo, Arapicos, Canelos, and Baeza are settlements of less importance, but all are in the midst of fertile zones which only await better means of communication to attract intensive colonization."

5: Reyes and Teran--127-130 (No date) 1939 Jivaro-1
116, 487

"All the routes of penetration into the Oriente are projects which are very far from realization. The lack of roads has been the underlying reason why the dominion of these vast regions by Ecuador has so far been only an ardent and unfulfilled desire. As yet neither the railroad nor the auto road has penetrated the forest. Only at intervals are there more or less improvable horse trails [caminos de herradura] and the rest are only difficult and arduous footpaths, which search for the liberating river--the sole route which permits the crossing of these infinite distances.

The routes of penetration used with some frequency in the Oriente are the following:

[128] 1. Leaving from Tulcán, the route of the Pun river, on the Ecuador-Colombia frontier, which, passing along the banks of the Chingual river, leads to La Fama, Sebundoy, El Cesáreo and ends at Valbuena. Some day it will perhaps reach as far as Santa Rosa de Sucumbíos and from there to the Putumayo.

2. Leaving from Quito, the route of the Papallacta, which leads to Baeza and then, surmounting the Cordillera of Guacamayos, takes the traveler to Archidona, Tena and Puerto Napo.

3. Leaving from Ambato, the route of the Banos river, which leads to Mera, Puyo and Canelos. From Mera, following the current of the Anzu toward the north, one can, by this route, penetrate as far as Puerto Napo. In the same way, one can advance to the south from the Puyo river as far as Macas, going by way of Arapicos. [129]

4. Leaving from Riobamba, the route of Chanala and Zuna, which leads to Puerto Proano, Macas, Sucúa and Mendez. The crossing of the Andean cordillera in this region is painful and arduous.

5. Leaving from Cuenca, the route of the Paute and Pan rivers, which leads to Mendez. This is the best horse trail of all those mentioned, although they have not been able to improve the way through the gorge of the Paute.

6. From the same town of Cuenca, one can leave by two other routes, that of the Gualaceo to Indanza, and that of the Sígsig which leads to Gualaquiza, across the páramos [GCB: high, cold regions] of Matanga.

7. Leaving from Loja, the route of the Zamora river, which leads to the settlement of this name as well as to those of Chito and Zumba, the most distant Ecuadorian outposts in the southern Oriente. [130] In addition to the above enumerated routes, there are other projects of penetration, especially in the direction of the Napo, such as those which would lead to Cayambe and Latacunga. Each of these settlements believes it has the best route into these various regions. On the Azuay river, as well, they speak of a route along the Paute which will lead the traveler more rapidly to the distant lands of the Oriente!

The railroad projects, including that of the Curaray, have been left abandoned. Even Ambato no longer dreams of it. Today this town is satisfied with the auto road which is

steadily advancing toward Mera and Puyo.

The trans-Amazon highway leaving from Puerto Bolivar on the Pacific and passing by way of Loja and Zamora to the Maranon river has gone up in smoke like an unrealizable desire."

5: Reyes and Teran--131-134 (No date) 1939 Jivaro-1
116, 635

"The present borders of the Oriente have resulted from the work of one of its most enthusiastic and intelligent leaders, Pío Jaramillo Alvarado. He demonstrated the absurdity of maintaining the ancient title 'Provincia de Oriente', whose governor exercised a control which was even less than abstract. The present political organization, even though it too may have faults and deficiencies, is slowly giving recognition to these forgotten regions and, above all, is making effective national sovereignty in the face of the pretentions of the southern neighbor [GCB: Peru].

The territory is divided into two provinces [provincias] and these, in turn, are divided into cantons [cantones] and parishes, [parroquias] as follows: [132]

I. NAPO PASTAZA. --Capital: Tena. 4 cantons and 20 parishes.
The cantons are:

1. Napo, including the towns of Tena, Papallacta-Baeza, Archidona and Loreto.
2. Sucumbíos, including the towns of Santa Rosa de Sucumbios, Farfán, Sigue, Putumayo and Cuyabeno. [133]

II. SANTIAGO--ZAMORA. --Capital Macas. 5 cantons and 20 parishes.
The cantons are:

1. Macas, including the towns of Arapicos, Zuna, General Proano, Chiguaza and Guamboya.
2. Morona, including the towns of Miazel, Morona and Yaupi.

3. Santiago, including the towns of Gualaquiza, Mendez, Rosario, Indanza and Santiago.

4. Zamora, including the towns of Zamora, Yacuambi and Sabanilla.

5. Chinchipe, including the towns of Zumba, Chito and Palanda. [134]

This demarcation has resulted after many years in giving our Amazonian territory new rights to self-administration, as it had in Colonial days, when it was divided into the governments of Yahuarzongo and Bracamores to the south, those of Llacas and Quijos in the central region, and those of Mocoa and Sucumbíos to the north. Today in the Napo provinces--Pastaza and Santiago--Zamora--the political and administrative personality characteristic of their sister states of the Andes already are being defined. Soon this development will permit them to take part consciously and worthily in the orderly progress of the national life."